Tattoo Removal Laser Machine

Operating Manual

Caution

- Do not directly look at the hole of the laser gun; otherwise the blindness will be happened.
- Make sure the stopper must be revolved off before the water injection, and then keep the water flowing normally.
- Make sure it must be distilled water or purified water when injecting the cooling water into the machine, tap water or mineral water is absolutely forbidden because it will result in water scale when heated, which will cause mechanical error of the machine.
- Make sure to check the water circulation and the joint between the machine and the hand-piece before running the machine.
- The operation should be done when everything is ready. If there are any abnormal sounds, please stop working immediately; and lighten on again after the capacitance being charged up inside machine.
- Make sure the machine is absolutely discharged before transportation.
- Make sure to change the water once one month

Warning

The treatment handle contains delicate and fragile optical components. During transportation, the case shock-absorbing package should be used, otherwise it may cause malfunction.

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1. **Safety Items**

1.1. **Equipment safety**

The X6 laser machine use single phase power supply of 220V, and the maximum output is no more than 3A. The power supply must be three wire battery outlets, the spec is 10A.

It is dangerous to open the protective cover optionally because the high tension exists inside machine during operation, even after the machine is power off, some parts of the machine would possibly have residue pressure.

1.2. **Transportation safety**

This YAG Laser system can be moved and transported easily, but since the treatment handle contains delicate and fragile optical components. So during transportation, the case shock-absorbing package should be used, otherwise it may cause malfunction.

1.3. **System safety**

For the system safety, please notice the following devices:

Simmer button: no laser can output in “standby” status.
Key switch: avoid unauthorized operation.

2. **Installation &Operation**

2.1 **System description**

This YAG Laser system contains optical-circuit system in the treatment handle, and electric-circuit system, computer system and cooling system in the console.

Specifications

Light source ----------Q-switched Nd: YAG solid-state laser
Wavelength----------1064nm/532nm/1320nm
Energy level----------100-2000mj
Fluence ----------≤ 20mJ/cm2
Pulse duration ----------8ns
Frequency----------1-10 Hz
Cooling system----------Built-in distilled water-circle system
Power requirement----------Single-phase 220V/10A
Size of the machine----------43×29×40cm
Weight----------12kg

Components and functions

- Key switch (general power switch): to turn on the system in clockwise and to power off the machine in anticlockwise.
- Simmer button: to press down, and the system come into ready for work status; to press down again, and the system goes back into standby status.
- Power indicator: to adjust the voltage.
- Frequency button: to adjust the speed of frequency
- Setting button: to set the language and the system interface.
- Foot-switch port: to step on the pedal for outputting laser.
- Insurance-cube port: to link with 10A , 5×20 insurance cube.
- Power socket: to exchange 110v/220v input plug with wire.

2.2. **Environmental conditions**

- **Normal conditions**
  - Temperature: 15℃~25℃
  - Relative humidity: 70％
  - Air pressure: 860-1060hpa
  - Power requirement: single-phase 110v/ 220v±10％； 10A

- **Conducting way**: Continuous running with intervals at every 5，000 times pulsing, 10 minute intermission is better.

- **Cooling system**: Built-in distilled water circle cooling system

2.3. Power requirement

Power source: single phase 110v/ 220v±10%，50hz±2%， 10A

- **Caution:** The power supply of this YAG Laser system must match with international standard three-hole plug in order to make sure the socket well grounded.

- **Caution:** The voltage range is between 110v, 220v and 240v. Firm-voltage device is necessary, which power requirement is 800VA.

2.4. Installation and operation:

2.4.1. Foot-switch installation

- Insert the foot-switch plug into the socket at the back of the case.

- Take off the non-hole stopper and change it with the hole stopper.

2.4.2. Operation

（The adoption of 1064nm head or 532nm head is according to the treatment）

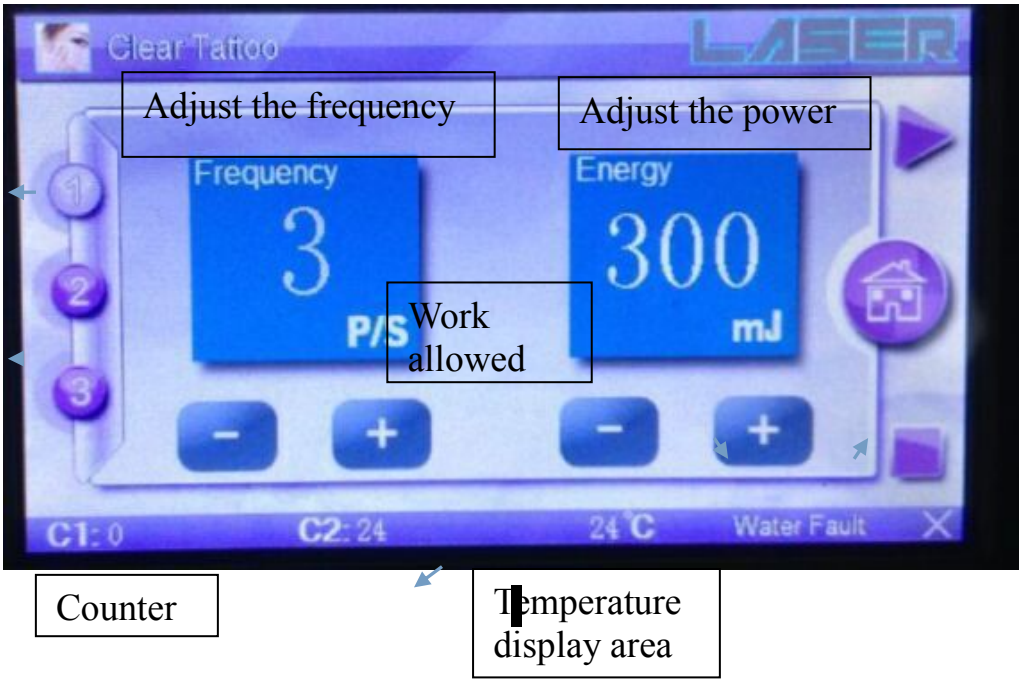
- First fill the tank with distilled water or purified water by a funnel (mineral water is not permitted). When you add water, please open the spillway and close the scupper, then keeps on observing it. Close the spillway when the water is full enough to outflow from the spillway.

- Start machine.
  1) Turn the key in clockwise to the “ON” position for simmering the system, and the monitor will show as picture 1, this is the greeting interface, then please press any button to enter treatment interface as picture 2.

(

picture 1）

（picture 2）



Adjust the frequency

Adjust the power

Keystoke presentation

Work allowed

Counter

Temperature display area

（picture 3）

As we can see, the screen is separated into 4 rows, on the first row is working voltage, of which the adjustable scope is 100-2000mj; On the second row is operating frequency, of which the adjustable scope is 1-6Hz; on the third row is temperature indicator on the left and working frequency counter on the right, and the counting range is 0-999999; on the fourth row is status indicator which indicates the function for each button.

When entered into the work platform, you can press the FREQ button and VOLT button to adjust the frequency and power: press the first button in the left to light up the machine; when Xe light is light up successfully, the keystroke state indicator will change into “blank shot”; press working button, and the state indicating area will show as “OK”, then you can operate the foot pedal; Meanwhile the system starts counting every pulse. When closing the system, press the working button to quit the work state; press the trigger button to quit the simmer state; and then turn off the machine with the key. (You can quit the simmer state by pressing trigger button during the treatment. When you keep stepping on the foot switch, all of the button will be without function.)

Adjust the frequency:

Release the foot pedal, press FREQ button to enter into the working frequency adjusting menu, press（+）to increase the frequency, and press（-）to decrease it, Adjust the voltage:

Release the foot switch, press VOLT button to enter into the working voltage adjusting menu, press（+）to increase the voltage, and press（-）to decrease it (the step is 10V, it is available to adjust from 100mj-2000mj),

Temperature display and protection.

The system has the temperature indicating function, from which the temperature of the circulating water can be checked any time. When the water temperature is higher than the programmed protective temperature, the “excessive temperature” will show on the screen with the alarming buzzer, and the machine will stop working in that case; when the temperature of the circulating water is lower than the enactment protection temperature, the machine will run normally.

4). When closing the system, firstly please release the foot pedal, then move away the hand-piece, next press the work button to quit the simmer state, and then turn off the machine with the key in anticlockwise, pull off the plug at last.

5). Usage of the transformer with wavelength of 532nm

Take off the 1064nm-wavelength transformer and change with the 532nm-wavelength transformer; other operations are as the same.

Caution: The light with wavelength of 532nm is harmful to your skin. Please read Annex 2 before operation.

2.6. Cleanness

Please clean the transformer with alcoholic gauze or tampon stick before and after each treatment.

3. Maintenance and troubleshooting

1). Basic maintenance

- **Clean the camera lens:**

The camera lens is at the back of the laser-sighting device, so before or after each treatment, please examine the surface of lens to see if there is any splash on it. If there is, please wipe the lens softly with alcoholic tampon stick.

- **Refilling cooling water:**

After the system running for 10 days, please screw off the spillway and scupper to draw off the water. Screw on the scupper after the water has been drawn off, and then refill the distilled water or purified water. If the water flows out from the spillway, it means the tank is full, and then screw on the spillway.

Caution: the cooling water must be distilled water or purified water.

2). Troubleshooting

Troubleshooting	Examinable parts
No power	● Examine the electric circuit ● Examine power plug and cable ● Examine the 10A insurance cube ● Examine the emergency shutoff knob
No laser output and buzz when step on the pedal	● Examine whether the system is in simmer status ● Examine whether the pedal switch is out of work
The output of energy becomes weak or blank shoot happens	● Examine whether the power supply is normal ● Examine whether the lens has been cleaned ● Examine whether the cooling water is flowing in circulating.

4. Accessories

4.1: Attention: 1064nm wavelength Q-switch laser should be used in the treatment of the black and the blue pigment.

1). Preparation before treatment

Make sure whether the patient's skin is keloid skin, whether they have purified their eyebrows, tattoo with other means. Explain to clients that after the treatment there still are pigment trace left which possibly caused by sunburn, or brown and red trace of composite painting material under your skin.

The left pigment can be cured with green 532nm-wavelength laser after 2 months interval. Make the client know the situation which may happen during the course of treatment to avoid dispute caused by ignorance. Better to shave the patient's eyebrow for easy operating before treatment.

2). Possible situation during treatment

When treating the very deep pigment tissue, since the pigment would absorb laser energy in great quantity, there may be burst of pigments accompanied with noisy sound. The client's skin may swell for the breakage of pigments, even bleed

Just after the first time treatment, the pigment may become very thin but it will recover in several minutes. This is the regular reaction of organization. It is suggested that the best time for second treatment is 2-3 months later after the first treatment.

Caution: During the operation, the eyelid board that is used for protecting the client's eyes must be used. Otherwise, the operation is very dangerous to the clients, for the blindness caused by laser radiation cannot be cured.

3). Possible situation after treatment

The hair may decolorize, or even fall off sometime. But fresh hair will grow up in four weeks. The bleeding and swelling will disappear in about one week to one months varied with individuals.

4). Physician care after treatment

No washing eyebrow lining with water within 3 to 7 days;
No sunshine;
Take the antibiotic medicines if necessary.

4.2 Attention: 532nm-wavelength Q-switch laser should be used in the treatment of the brown and red pigment.

The 532nm wavelength laser is green light, which is different from the laser with wavelength of 1064nm.

The hemoglobin and man-made brown or red pigments absorb the laser with wavelength of 532nm. Since the normal skin can also absorb it, the cuticle tissue may vaporize in surface, and there may be blood clots called "purpura" in the medical service. When the brown and red pigment absorb the 532nm laser, it will be demolished and pop out from body or be smashed down and expelled by metabolizing.

4.2.1Side-effects from the treatment of the black and blue pigments

1).Special pigments may fall off and the common pigments may precipitate since the vaporization of skin and death of cuticle.

2). There may be swelling or blood clot under skin, however it will recover in 20-60 days, varied with individuals. Low energy density (small spot) shall be used in the treatment of the brown or red pigment with 532nm wavelength laser. Repeat the operation for several times if necessary, but at least with 2 months interval.

3). before starting the treatment, explain to clients the possible side-effect. In some cases the tattoo contains iron ion, which will cause the paint

oxidized and make the treatment failure. (No washing with water and sunburn after the treatment against infection and pigment precipitation)

4). Direct sight at 532nm wavelength laser may cause blindness. All people present in the treatment room must wear protective eyewear, and only the people concerned with the treatment should be allowed to access to the treatment room.

4.2.2Annex: Instructions and attentions for black diamond

1). Clean face.
2). Daub the whole face with black diamond.
3). Aim at the treatment part by 1064nm wavelength laser.

◆ **Caution:** It is forbidden for those people who are in wound or acne.

◆ **Treatment frequency:** 5 times for a course of treatment, the interval is 21-28 days.

5. Configuration

Main body	Protective glasses	Foot switch	Power supply wire
Power supply key	Instructions	Laser output head （1064nm）	Frequency multiplier (532nm)
Water filler			